Formatting Instructions For NeurIPS 2022

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1 Principal Component Analysis

1.1 Processing the data and calculating Eigenvalues

No written part

1.2 Plot of the Eigenvalues

The number of components needed to capture 50% of the energy is 3. This is displayed in the figure below.

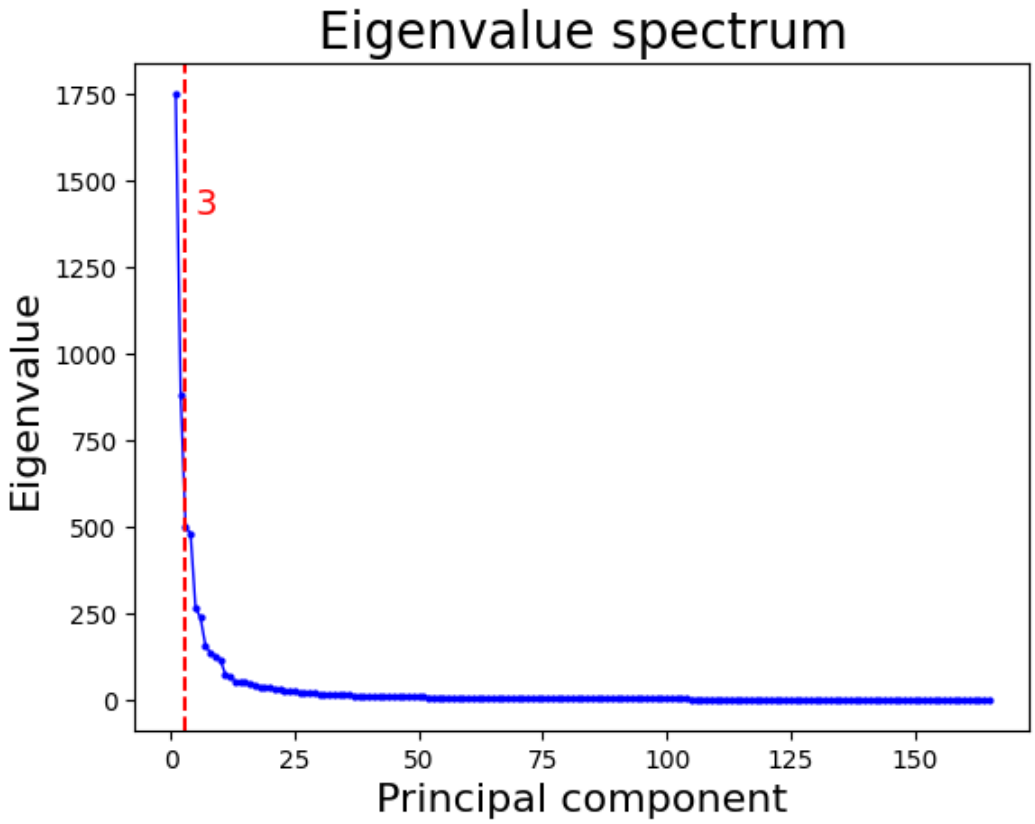

Figure 1: Eigenvalue Spectrum

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1.3 PCA and Eigen Faces

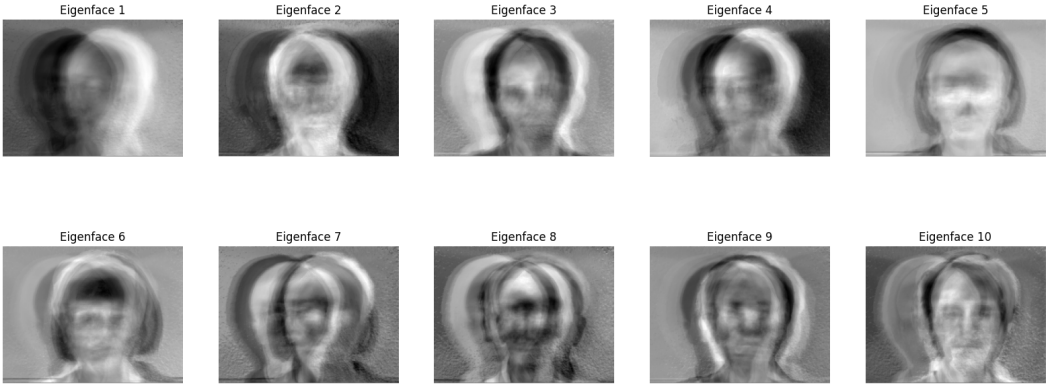

Figure 2: 10 eigen faces

1.4 Projection and Reconstruction

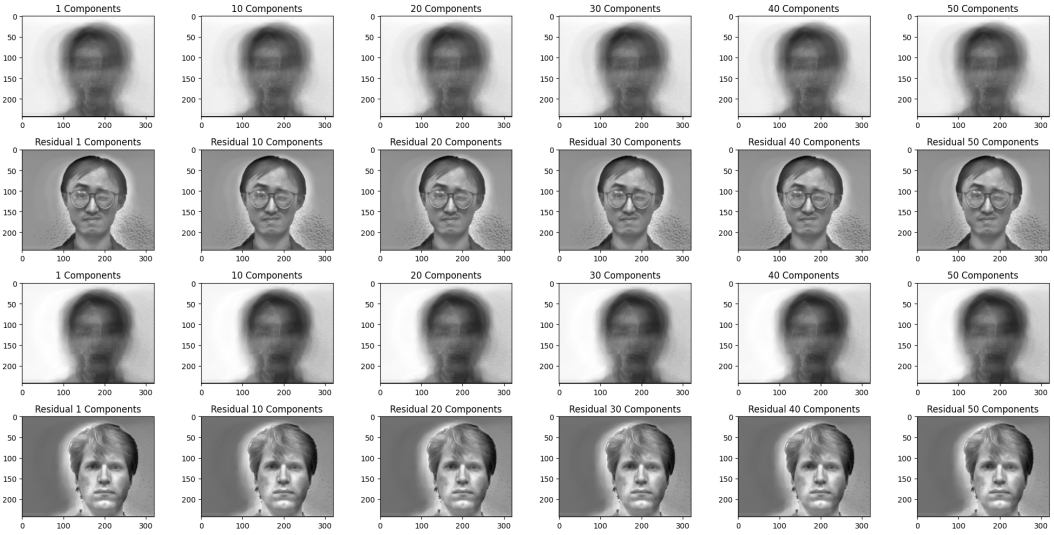

Figure 3: Reconstruction

From these visualizations, only one component is required to achieve a visually good result.

References

[1] Watt, Jeremy, Borhani, Reza & Katsaggelos, Aggelos Konstantinos (2016) Machine Learning Refined.

[2] Konasani, Venkata Reddy & Shailendra Kadre (2021) Machine Learning and Deep Learning Using Python and TensorFlow.